UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,496	11/30/2000	Masayoshi Koike	PM 275294 FOO-212-US	8880

7590 07/02/2003

SEAN M. MCGINN
MCGINN & GIBB, PLLC
8321 OLD COURTHOUSE ROAD
SUITE 200
VIENNA, VA 22182-3817

EXAMINER
CRANE, SARA W

ART UNIT	PAPER NUMBER
2811	

DATE MAILED: 07/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/725,496	KOIKE ET AL.	
	Examiner	Art Unit	
	Sara W. Crane	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,5,7-9,11 and 13-43* is/are pending in the application.

4a) Of the above claim(s) *7,8,13,14,16,18,20,23,26,31 and 34* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,5,9,11,15,17,19,21,22,24,25,27-30,32,33 and 35-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-2, 5, 9, 11, 15, 17, 19, 21-22, 24-25, 27-30, 32-33, and 35-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goetz et al. and Major et al., considered together.

Goetz et al. teaches at column 3, lines 50-54, a light emitting device having an active layer which can be a single quantum well of AlInN. A substrate, and a plurality of other device layers, would have been obvious in order to form a functioning device. An active layer of $Al_{1-x}In_xN$, with x in the range of 0.1 to 1, would have been obvious in view of the teaching of AlInN, because AlInN means the amount of In can vary from 0 to 1, and this range encompasses 0.1 to 1, and therefore anticipates the range of 0.1 to 1. Anticipation is the epitome of obviousness. Alternatively, it would have been obvious to choose compositions for an active layer of AlInN where In varies from 0.1 to 1, because this is 90% of the maximum possible range of 0 to 1, because variation of the amount of In allows for variation of bandgap, as noted by Major et al. at column 2, lines 8-24, and because varying the bandgap of the active layer allows one to vary the wavelength of the emitted light. Major figure 2 is a similar teaching, in which the top line of the triangle, connecting AlN to InN, represents all of the compositions of AlInN, where the amount of In varies from 0 to 1. Column 2, lines 8-24, of this reference notes specific advantages associated with all of the materials in the entire phase diagram for AlGaInN,

and any of these advantages would be sufficient motivation for choosing any specific range of In concentration. Choice of bandgap for emission, confinement energy, compatibility with MOCVD processing, and ease of doping are mentioned specifically as advantages which would motivate a specific choice of material. Lattice matching to known substrates, and to other layers, is discussed with respect to Major figure 1 in the paragraph spanning columns 6 and 7, which is another motivation for a specific choice of material.

With respect to the dependent claims, the composition ranges are encompassed by the Major teaching of AlGaInN, particularly in view of the diagram of Major figure 2, and would have been obvious to optimize barrier height for a specific choice of active layer, for example, where the active layer material is chosen for desired wavelength emission. Quantum well thicknesses as recited would have been obvious for the same reason, i.e., as a known means of tailoring the wavelength associated with a particular quantum well.

Conclusion

Applicant's arguments filed with respect to the rejected claims have been fully considered but they are not persuasive. Applicant notes that the specific range recited for the In concentration of the active layer, 0.1 to 1, is not taught in the prior art. As noted above, the prior art of Major et al. shows that an In concentration ranging from 1 to 0 in AlInN is known. Applicant points out several advantages of AlInN for use as an active layer (larger lattice constant, "softer," processing advantages), but these

advantages accrue to all active layers of AlInN, such as the one taught by Goetz et al. None of the advantages would be associated with the claimed In concentration range of 0.1 to 1, as opposed to an In concentration of 0 to 0.1, which is the only part of the range excluded by the claim language.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (703) 308-4894.

The fax phone number for this Group is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist, whose telephone number is (703) 308-0956.

Sara W. Crane
Primary Examiner
Art Unit 2811